



Photo: Karena Dilleo

Photo: D. Golden

## ENDANGERED SPECIES SPOTLIGHT

### Eastern Tiger Salamander

Eastern tiger salamanders, *Ambystoma tigrinum tigrinum*, are the largest salamander in New Jersey, reaching up to 13 inches in length. Tiger salamanders are dull brown with irregular yellowish blotches and a yellow underside; they have a short snout, thick legs, long tail, and large lidded eyes. Like other Ambystomid, or mole salamanders, tiger salamanders are fossorial, spending much of their lives underground.

In New Jersey, tiger salamanders live in upland forests of the coastal plain in underground burrows, feeding on worms, snails, and insects. In December, they emerge on rainy nights and migrate to vernal pools to breed, depositing egg masses of 30-70 eggs on submerged vegetation. By March adults have finished breeding and will return to their upland burrows. Eggs hatch in approximately 30 days, and larvae

remain in pool feeding on zooplankton and invertebrates before metamorphosing in June or July. These new sub-adults will migrate to nearby forests where they will live underground for 4-5 years until reaching sexual maturity and beginning their yearly migration to breed.

Eastern tiger salamanders are the most widely distributed salamander in North America. However, the eastern population is disjunct and declining. Historically tiger salamanders ranged from southern New York to northern Florida but the species is now state-endangered in New York, New Jersey, Delaware, Maryland, and Virginia, and is extirpated in Pennsylvania. In New Jersey and throughout the eastern range, tiger salamanders are declining due to habitat loss, development, fragmentation of upland and breeding habitat, changes in

hydrology, pollution, collecting (pet trade), and climate change.

Ambystomids, like the eastern tiger salamander, are vernal pool obligate species—they require vernal pools to breed. Vernal pools are isolated, ephemeral wetlands with a seasonal hydrology that naturally varies from year to year depending on evaporation, water vapor transport, precipitation and physical attributes such as proximity to other wetlands, size, surrounding vegetation, and access to groundwater<sup>1</sup>. Due to these characteristics, vernal pools are highly susceptible to climate change. As local weather conditions become more variable, so will the hydroperiod of these pools, which affects species composition, productivity, and long-term viability of these ecosystems.

*continued on page 3*

*In our devoted efforts to protect and restore rare wildlife in New Jersey, we have so much for which to be thankful. Some of our keystone wildlife species are enjoying strong and inspiring recoveries.*

*Ospreys, peregrine falcons, and bald eagles have returned to their prominent roles as lords of the skies. Bobcats are stabilizing their populations in the more rural northern parts of the state. And humpback whales and harbor seals are increasing along the Atlantic coast.*

*Yet the challenges many wildlife species face in New Jersey are more daunting than ever:*

- *Climate change has announced itself unmistakably in New Jersey these past few years, both along the coast and inland.*
- *Invasive species impact every single habitat in New Jersey, and global trade expands this threat by the year. The latest invasive threat is a Chinese pond mussel found in Hunterdon County – the first time it has ever been identified in American waters!*
- *New diseases pose grave threats to many of our native species. Ranavirus – a killer of both amphibians and reptiles – recently made its first known appearance in New Jersey. And white-nose syndrome continues its tragic assault on America’s bats.*
- *Manmade pollution and debris threaten many species of wildlife, from the infinite wash of discarded plastic bags to the old fishing net that nearly strangled an osprey chick – moments seen live by our concerned webcam viewers.*

*These large-scale challenges demand new thinking. We must be creative in our responses. In Cape May County, our innovative vernal pool construction is enabling tiger salamanders to better adapt to sea level rise and climate change.*



*David Wheeler*  
Executive Director

*We must collaborate, developing partnerships that span borders and industries. To protect shorebirds in New Jersey, we partner with schools in the Bahamas and hunting groups in the Arctic tundra. The birds don’t stop their migrations at our borders – and our surveys and research must follow their leads.*

*We must utilize technologies new and old – from high-tech microchips and sonar to track birds and bats, to utilizing salvaged wood along with a trusty hammer and nails to build osprey platforms.*

*Most of all, we must adapt to changing times. Our creativity and our dedication can lead the way for wildlife. The futures of so many species hang in the balance.*



CWF biologists Stephanie Egger

and Todd Pover go global, working to protect piping plovers across their winter habitat in the

Bahamas. A special thank you to Minnie Mouse and the Disney Worldwide Conservation Fund for funding this important research.

## ENDANGERED SPECIES SPOTLIGHT – Eastern Tiger Salamander



Photo: J. Bunnell

In New Jersey, precipitation is expected to increase overall, but the pattern of rainfall will lead to longer drying events causing premature water loss in vernal pools. These longer drying periods will cause drying of smaller pools, isolating of larger pools, and diminishing of metapopulations dynamics<sup>1</sup>. The potential consequences of these shorter hydroperiods will be significant reproductive failures in vernal pool-breeding amphibians, as larvae are unable to metamorphose before the pool dries<sup>2</sup>.

Eastern tiger salamanders are limited to 15 known breeding pools with uncertain long-term viability in New Jersey. The majority of these pools are single pond complexes. If the pool becomes degraded, lost to development, or simply dries, the salamanders will be unable to breed that year. These sites are also divided by roads and development, which makes yearly migration uncertain and weakens the possibility of finding a new breeding pool or interbreeding with other tiger salamander populations.

Thirteen of these remaining pools are located along the Cape May Peninsula, and half are below two meters above sea-level, increasing their risk of salt-water intrusion or inundation from storm surge. Conserve Wildlife Foundation and the New Jersey Division of Fish and Wildlife are mitigating for these potential pool losses by constructing new vernal pools along the Cape May

Peninsula that are greater than 3 meters above sea-level. These new pools will restore connectivity between existing breeding sites and aid in the migration of tiger salamanders north along the peninsula. This work is funded by the NJ Division of Fish and Wildlife and a Climate Adaptation Grant from The Wildlife Conservation Society. ✈

1. Brooks RT. 2004. Wetlands 24(1):104-114
2. Brooks RT. 2009. Climactic Change 95: 469-483

### ENDANGERED OR THREATENED

#### What's the difference?

*An endangered species is in danger of becoming extinct throughout all or most of its range. A threatened species is likely to become endangered in the foreseeable future.*

## Thank You Disney!

### Conserve Wildlife partners with Bahamas group on piping plover work

CWFNJ Biologists Stephanie Egger and Todd Pover just returned from the island of Abaco in the Bahamas, where they were conducting piping plover research and developing education programs. This project is generously funded by the Disney Worldwide Conservation Fund.

“A tremendous amount of resources are invested in protecting piping plovers on their breeding sites, but they spend at least half their annual life cycle in migration or on their wintering grounds,” Pover said. “It is equally important to extend conservation beyond New Jersey in order to ensure their long-term survival.”

CWFNJ is working in conjunction with a local environmental group in Abaco, Friends of the Environment, to develop and implement a comprehensive education and outreach program for school children and the local community. We will also target the bonefishing industry as this work will benefit other species that depend on tidal flat habitats, such as conch, bonefish, and sharks. Another exciting educational component will be a sister school program between a New Jersey school and an Abaco

school where students will be able to exchange information via email, blogging, Skype, and other social media tools.

A second trip to Abaco is planned at the end of January to focus more on piping plover surveys, which will be conducted by Egger and Pover and local volunteers that will be trained as part of the program. Data collected during these surveys will benefit the International Piping Plover Census effort in 2016, but annual surveys are also critical to the long-term recovery of the large segment of plovers that breed on the Atlantic Coast and winter in the Bahamas.

“By applying all of our group’s organization, research, education, and species conservation management expertise and abilities, we are able to build education, community relationships, and partnerships that are critical to migratory bird conservation, especially for piping plovers,” said Egger.

In addition to the Bahamas grant, Disney also funded a CWFNJ project to help identify important migratory locations for piping plovers in New Jersey. That project will kick off in the spring. Stay tuned for more news about both of these exciting projects! ✈

# Conserve Wildlife To Upgrade Jersey City Falcon Webcam

“Falcon High Fliers Club” to offer public the chance for a front-row seat of falcon “reality show”

Since 2001, 101 Hudson Street has been home to the Jersey City Falcon WebCam – the oldest wildlife webcam in New Jersey. This beloved webcam streams live video into homes, offices, and schools throughout New Jersey and beyond.

Hundreds of thousands of viewers have been enthralled by the real-life “reality show” of peregrine falcon families, watching the fastest animals on earth court their mates, hunt for prey, incubate their eggs, and care for and feed their young.

Since its inception, the Falcon WebCam has been a joint collaboration between the nonprofit Conserve Wildlife Foundation of New Jersey and the State Division of Fish & Wildlife. Unfortunately, due to State budget cuts, there is no longer any dedicated funding for the Falcon WebCam. The Conserve Wildlife Foundation will take over the Falcon WebCam completely – but only with the support of businesses and individuals like you.

To be ready for the 2014 nesting season, CWF will be upgrading the Falcon WebCam with a new camera and associated hardware and software. CWF will also be developing a modernized and expanded educational curriculum centered around the Falcon

WebCam. This curriculum guide – The Peregrine Project – will use the Falcon WebCam as a tool for teaching concepts including animal behavior, bird biology, food chains, contamination, endangered species, biodiversity, and urban wildlife. The curriculum is designed to be free for all schools, which is especially appealing in these times of school budget cuts.

CWF will be joined in our efforts by many of you – our inaugural members of the “Falcon High Fliers Club”. Members will be eligible for a drawing to join our biologists in banding the next brood of falcon chicks, along with other exciting opportunities and prizes.

Joining is free – and it’s as simple as entering your basic contact information on our Peregrine webpage, [www.ConserveWildlifeNJ.org/PeregrineCam](http://www.ConserveWildlifeNJ.org/PeregrineCam).

Modernizing the Falcon WebCam and curriculum won’t be easy, and Conserve Wildlife Foundation is seeking both corporate partners and individual donors to help us cover the costs. Visit our Peregrine webpage for more information on how to help. ✈

## Become a Monthly Supporter – Help Stop Species Loss 12 Times a Year



Photo: © Eric Sambol

Commit to protecting wildlife by becoming a monthly contributor to Conserve Wildlife Foundation of New Jersey and sustain our work throughout the year!

As a monthly supporter, you will be helping to stop species loss in a real and tangible way.

- For \$10 monthly, you will help us to build and install an osprey platform.
- For \$20 monthly, you will buy 12 feet of fencing to protect terrapins crossing Great Bay Blvd. in Little Egg Harbor.
- For a dollar a day, or \$30 monthly, you will allow us to deploy a steward on Delaware Bayshore beaches to protect shorebirds from dangerous disturbances.

As a thank you for your pledge, we will send you the [New Jersey Wildlife Viewing Guide](#), written by Laurie Pettigrew and Sharon Mallman, to inspire your own wildlife exploration in the Garden State.

**A monthly gift is quick and easy to set up. Simply visit:** [www.ConserveWildlifeNJ.org/GetInvolved/Donate/](http://www.ConserveWildlifeNJ.org/GetInvolved/Donate/)

Choose the amount that works best for you, and your gift will be securely transferred from your credit card or bank account each month. You will receive a tax receipt for your cumulative contributions each January. You will also receive our membership benefits – our newsletter, Tracks, our e-magazine, Explorations, and invitations to our events and presentations. If you ever reconsider, your monthly pledge can be canceled at any time. ✈

## House Party in Essex County brings Wildlife and Art to Life

Conservation artist Tricia Zimic recently hosted a party at her Maplewood home and studio to highlight the work Conserve Wildlife Foundation is doing to protect New Jersey's peregrine falcons.

Tricia creates inspiring and thought-provoking sculptures and paintings that capture the improbable dichotomy of wildlife thriving in urban and heavily impacted landscapes. She is dedicated to raising awareness of the need to protect endangered species through her art, with her works focusing heavily on species like peregrine falcons, bobcats, and salamanders.

At the event, Tricia led a personal tour of her life-sized creatures for the guests. Our biologists, Ben Wurst and Larissa Smith, also presented on Conserve Wildlife Foundation's efforts to protect ospreys and bald eagles.

Conserve Wildlife Foundation is grateful for supporters like Tricia who open up their homes to introduce friends and neighbors to our organization's important work. Please contact Liz Silvernail at [liz.silvernail@conservewildifenj.org](mailto:liz.silvernail@conservewildifenj.org) if you, too, would consider hosting a party to benefit our hands-on efforts to protect New Jersey's rare wildlife.

To learn more about Tricia Zimic's remarkable work, go to [www.TriciaZimic.com](http://www.TriciaZimic.com). ➤



Partygoers enjoy the "wild life". (Left to Right) Bob Coleman, Maura Janiszewski, Marty McHugh, Brian Haggerty and Roberta Swartsman



Executive Director David Wheeler presents peregrine falcon Adopt-A-Species to host Tricia Zimic.

## This Holiday Season, Get Out & Watch!

For 114 years, volunteers have counted birds during the annual Christmas Bird Count. From December 14, 2013 through January 5, 2014, you can join tens of thousands of people in the longest-running wildlife census used to assess the health of bird populations. You must follow a specific set of instructions, but it's easy to participate. You can count the birds in your backyard, from the comfort of your living room, or outfitted in warm clothes and boots as you take an adventure outside to see what you can find in the woods and fields of your neighborhood. For more information and to find the nearest "Count Circle," visit <http://Birds.Audubon.org/Christmas-Bird-Count>. If you would like a simple bird guide to help you, please visit our online store at [www.ConserveWildlifeNJ.org](http://www.ConserveWildlifeNJ.org).



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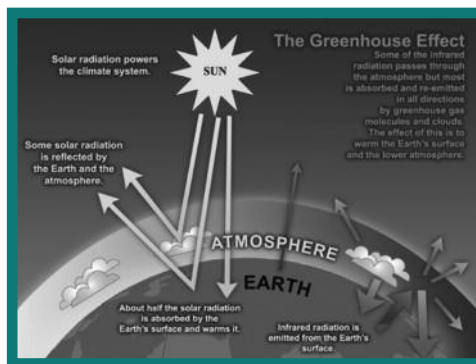
# Climate Change: A Simple Primer

Climate change is discussed more urgently with each passing year – and each major storm. We know that it is having a serious impact on many species of at-risk wildlife, from the eastern tiger salamander (see page 1) to shorebirds like red knots and piping plover. But not everyone understands what climate change really entails. Here's a primer:

The earth's atmosphere contains specific gases, called greenhouse gases, which trap heat from the sun and warm the earth. As the sun's radiation reaches earth, land and water absorb most of this energy and the rest is reflected back into space. As the earth warms, it emits infrared radiation into the atmosphere; greenhouse gases trap some of this radiation, warming the earth to its average 15°C and sustaining life on earth. Without these naturally occurring greenhouse gases, too much infrared radiation would be emitted into space and the earth's average temperature would only be -18°C, much too cold to support life<sup>1</sup>.

However, in the last century the global average temperature has increased 1.3°F due to the build-up of excess greenhouse gases, like CO<sub>2</sub>, caused by human activities like burning fossil fuel and deforestation. These emissions exacerbate the greenhouse effect by trapping more infrared radiation in the atmosphere and causing temperatures to rise.

Warming air and water temperatures cause melting of glacial ice caps and continental ice sheets. This decreases the albedo (reflectivity of the earth's surface), thus increasing the amount of solar radiation absorbed by the earth and intensified warming. These rising temperatures cause thermal expansion of seawater and melting of ice caps and ice sheets which causes an increased influx of freshwater into the oceans contributing to rising sea-levels. Warmer waters also feed energy into weather systems triggering more frequent and intense weather events like hurricanes, floods, and droughts<sup>1</sup>.



In the northeastern United States, temperatures are expected to rise over the next century as precipitation fluctuates with wetter winters, dryer summers, and more sporadic rainfall, creating longer droughts, and more intense rainfall<sup>2</sup>. Increasing temperatures will cause earlier snowmelt with reduced runoff, increased evapotranspiration with seasonal water deficits in the summer and decreased water surplus in winter<sup>3</sup>. As climate patterns shift, the Northeast will experience longer growing seasons, altering forest composition and increasing water demands<sup>3</sup>.

The Northeast will also be affected by rising oceans. Sea-level is rising along the Mid-Atlantic 3mm per year, roughly twice the global average<sup>4</sup>. Even this slight rise in sea-level may be significant enough in some developed areas to cause flooding during high tide events. Coastal areas currently 1.5 meters above sea-level are predicted to have a 50% chance of being flooded by spring high tides if sea-level rises 80cm as predicted by 2125<sup>4</sup>. Land at high elevations of 3.5 meters above sea-level may be at risk for inundation by 100-year flood surges by 2200 when sea-level has a 50% chance of rising 1 meter<sup>4</sup>.

In New Jersey, we are already seeing the effects of a changing climate with earlier springs, hotter summers, and warmer winters with less snowpack. The frequency and intensity of strong storms has increased. With it, stronger storm surges combine with rising sea-levels to threaten the coast with salt-water intrusion and, in some locations, complete inundation.

The challenges are clear – for humans and for wildlife alike. ➤

1. Solomon et al. 2007. Fourth Assessment Report of the Intergovernmental Panel on Climate Change
2. Hayhoe. 2007. Mitigation and Adaptation Strategies for Global Change
3. Brooks. 2009. Climatic Change 95:469–483
4. Titus and Wang. 2008. EPA 430R07004

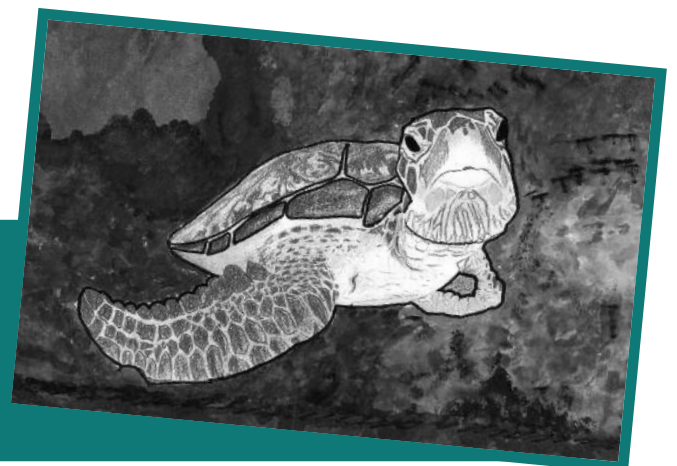
## Attention 5th Graders

# Species Edge

On The

## Art & Essay Contest is Open

Choose an endangered animal that lives in New Jersey – draw a picture and write a short essay about it and send it in. It's free to participate. Get your contest kit today at [www.ConserveWildlifeNJ.org](http://www.ConserveWildlifeNJ.org). Entries must be postmarked by January 31, 2014.



# BEHIND THE SCENES

Courtney Zinna—Intern

Courtney began interning with Conserve Wildlife Foundation this past summer. She has proven her passion and talents time and time again, helping us with our donor management and education coordination. Her bubbly personality and willingness to help us with just about anything, keeps us motivated and moving forward. Courtney will be attending Ross University School of Veterinary Medicine in January.

### What delights you in your daily work?

All of my jobs have consisted of working with animals or working to raise money for animals. So as long as I am working with animals or for animals, it delights me.

### If you couldn't do what you are doing now, what profession would you attempt?

I am in the process of interviewing for Veterinary School with the hope of becoming an Exotic Vet, but if I could not be a veterinarian or work with animals, I would want to be a teacher. I have always loved school since I was a little girl and love learning new things. I also love helping people study and knowing that I helped someone achieve a better grade for a class or test, is a great feeling!

### What is the best thing anyone ever taught you?

My love for animals, which I credit in part to my dad. From just a little girl at the age of three, my dad allowed me and my siblings to rescue any injured wildlife we happened to find. This taught

me all the responsibilities that go along with carrying for an animal and most importantly encouraged my dreams of being a veterinarian.

### What is one thing you learned working here that surprised you?

I learned how many endangered species there are just in New Jersey. I never realized how many species I see everyday that are actually endangered or threatened and how there are so many easy ways to help wildlife in my own backyard!

### If you could be one animal (that lives in NJ of course!) what would you be and why?

I would be a bobcat! They are such beautiful and interesting creatures. I would love to see what life would be like from their perspective and also to learn more about them as a species, since they are not often seen by people. 🐾



## Explorations

In addition to TRACKS, we also produce an electronic magazine called Explorations. This e-magazine tells stories about New Jersey's wildlife, enabling us to take advantage of electronic communications to present full-color photographs and links to more information. The most recent edition of Explorations features the winners of the 2013 Species on the Edge Art & Essay Contest, and stories about the Jersey City peregrine banding and the OspreyCam.

If you would like to subscribe to Explorations, please send your email address to [info@conservewildlifenj.org](mailto:info@conservewildlifenj.org) and put "Explorations" in the subject line.

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Our mission is to protect and preserve the rare and imperiled species of wildlife that live, breed, and migrate through our state by restoring habitat, managing species, educating and engaging citizens, and conducting research.



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# TRACKS TRACKS

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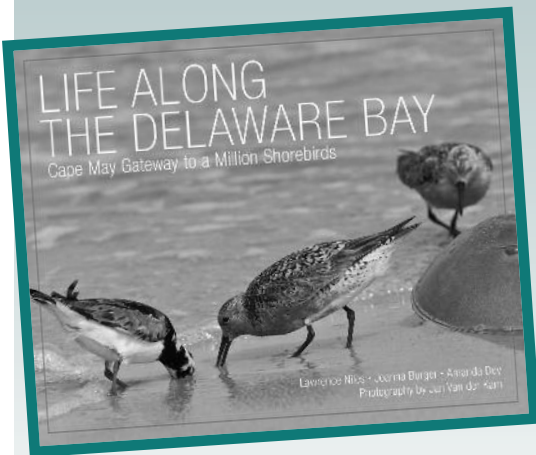
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When you purchase gifts from Conserve Wildlife Foundation, you show your friends and family that you not only care about them, but you care about wildlife, too. Your gift supports our work to protect New Jersey's rare and imperiled wildlife.

Visit [www.ConserveWildlifeNJ.org](http://www.ConserveWildlifeNJ.org) to check out our unique Adopt A Species Program and other great holiday gift ideas!

## AT THE TOP OF YOUR LIST – Life Along the Delaware Bay

Written by CWF partner Larry Niles, in concert with Joanna Burger and Amanda Dey, and illustrated with beautiful images by renowned photographer Jan Van der Kam, this fascinating book celebrates this globally important and ecologically diverse bay and the natural phenomena that make this place special. Over 300 stunning color photographs capture the beauty of this unique treasure.



## SHOW YOUR SUPPORT FOR NJ'S RARE WILDLIFE – CWF T-shirts

Our vibrant, new Adopt-A-Species inspired t-shirts are perfect for a wildlife enthusiast.